INTRODUCTION

The ocular surface is a complex biological continuum responsible for the maintenance of corneal clarity, elaboration of a stable tear film for clear vision, as well as protection of the eye against microbial and mechanical insults. The ocular surface epithelium comprises corneal, limbal and conjunctival epithelia, of which the conjunctiva extends from the corneal limbus up to the mucocutaneous junction at the lid margin, and is divided anatomically into the bulbar, forniceal and palpebral regions. The precorneal tear film, neural innervation and the protective blink reflex help sustain an environment favourable for the ocular surface epithelium ***(Ang and Tan, 2004)***.

Limbal stem cells are considered to be located atthebase of limbal epithelium are responsible for the repopulation of corneal epithelium. They also act as a junctional barrier, not allowing conjunctival tissue to grow over the cornea. Its dysfunction or limbal deficiency could lead to a sequence of abnormal phenomena on the ocular surface characterized by abnormal corneoconjunctival healing, corneal neovascularisation, chronic epithelial defects, severe stromal inflammation, and conjunctivalisation leading to corneal opacification and loss of visual acuity ***(Kruse, 1994)***.

Limbal deficiency could be caused by ocular burn (alkali or acid), ocular cicatricial diseases (Stevens-Johnson syndrome, ocular

cicatricial pemphygoid), and keratopathy induced by contact lens wear ***(Nishiwaki-Dantas et al., 2001)***.

To surgically reconstruct these eyes a keratolimbal graft-either from the other, healthy eye of the same patient (autograft) or from donor material (allograft)-can be carried out, and this approach has been beneficial in a number of situations. Autografts, however, are not an option for bilateral injuries, and even when they are feasible have drawbacks because they require a fairly large limbal graft be taken from the healthy eye which is not without risk. Allografts invariably carry the risk of rejection.

Recently, a new approach that involves the transplantation of cultivated corneal limbal cells to treat stem cell deficient eyes has provided promising results ***(Koizumi et al., 2001)***. Initial work established the fact that cells from healthy limbal tissue could be cultivated in the laboratory and grafted onto severely damaged eyes to successfully reconstruct the ocular surface. Clinically, the first application of this new surgical technology was reported by ***Pellegrini and colleagues (1997)***.

Later, the concept was applied to both autologous and donor limbal epithelial cells to make epithelial cell sheets using amniotic membrane as a growth substrate and carrier. The membrane can serve not only as an epithelial carrier but also as a healthy substrate to cover a damaged corneal stroma. Clinical data indicated that this new procedure was a good option for the repair of the corneal

surface when limbal stem cells were lacking. The use of limbal epithelial cells expanded ex vivo on amniotic membrane holds much promise for the surgical reconstruction of severely damaged, stem cell deficient eyes***(Kinoshita, 2002)***.

Aim of the Work:

The aim of the work is to evaluate the role of limbal stem cell in ocular surface reconstruction.